Ordering number: EN 1636D

CMOS LSI



No.1636D

LC7818

Function Switch

Use

Function switchover of amplifier, receiver, etc. and tape monitor control

Features

(1) 2-channel 5-position source select + tape monitor on chip
(2) Control input pins of input/output common type (Key input and LED display)
(3) Delivers audio muting control signal.
(4) Possible to select operation modes of backup mode, initialization mode, automatic switchover of function
(5) Supply voltage ±20V, single-supply operation available

Absolute Maximum Ratings at Ta = 25°C, V_{SS} = 0V

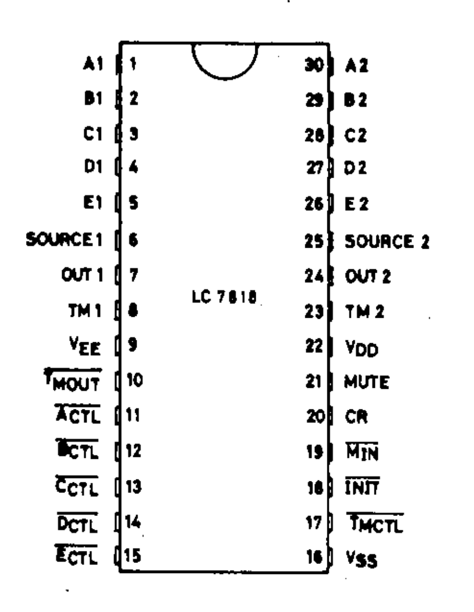
					unit
Maximum Supply Voltage	V_{DD} max	V_{DD}	$V_{EE} \leqq V_{SS}$	V_{SS} − 0.3 to +20	V
	V_{EE} max	V_{EE}		−20 to V_{SS} + 0.3	V
Output Voltage	V_{OUT}	$\overline{ACTL}$ to $\overline{ECTL}$, $\overline{TMOUT}$		V_{SS} − 0.3 to V_{DD} + 0.3	V
Output Current	I_{OUT}	"		30	mA
Voltage Difference at Analog Switch-ON Mode	ΔVon		Switch ON	0.5	V
Allowable Power Dissipation	Pd max		Ta ≦ 85°C	500	mW
Operating Temperature	Topg			−30 to +75	°C
Storage Temperature	Tstg			−40 to +125	°C

Allowable Operating Conditions at Ta = 25°C, V_{SS} = 0V, $|V_{DD}| \geqq |V_{EE}|$

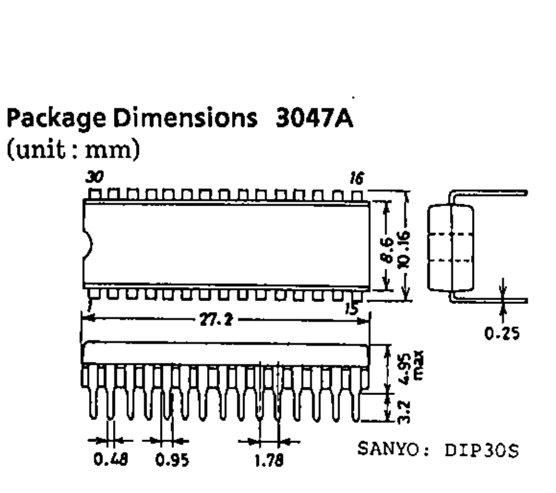
				min	typ	max	unit
Supply Voltage	V_{DD1}	V_{DD}	V_{DD}-$V_{EE} \geqq$ 12V	V_{SS} + 6		V_{SS} + 18.5	V
	V_{EE}	V_{EE}		V_{SS} − 18.5		V_{SS}	V
	V_{DD2}	V_{DD}	$V_{EE} \leqq V_{SS}$ backup	V_{SS} + 3		V_{SS} + 18.5	V

Continued on next page.

Pin Assignment



Package Dimensions 3047A
(unit : mm)



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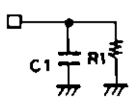
				min	typ	max	unit
Input "H" Level Voltage	V_{IH}	$\overline{ACTL}$ to $\overline{ECTL}$, $\overline{TMCTL}$		$0.7V_{DD}$		V_{DD}	V
		$\overline{Min}$		$V_{DD}-1.0$		V_{DD}	V
		$\overline{INIT}$		$V_{SS}+3.0$		V_{DD}	V
Input "L" Level Voltage	V_{IL}	$\overline{ACTL}$ to $\overline{ECTL}$, $\overline{TMCTL}$		V_{SS}		$0.25V_{DD}$	V
		$\overline{Min}$		V_{SS}		$V_{SS}+1.0$	V
		$\overline{INIT}$		V_{SS}		$V_{SS}+0.5$	V
Input "M" Level Voltage	V_{IM}	$\overline{Min}$		$0.45V_{DD}$		$0.55V_{DD}$	V
Analog Switch Input Voltage Range	V_{IN}	A1 to E1, A2 to E2, SOURCE1,2 TM1,2		V_{EE}		V_{DD}	V

Electrical Characteristics at Ta = 25°C, V_{SS} = 0V, $|V_{DD}| \geqq |V_{EE}|$

				min	typ	max	unit
Output "H" Level Voltage	V_{OH}	MUTE	I_{OH}=−0.4mA, $V_{DD} \geqq 9V$	$V_{DD}-0.5$		V_{DD}	V
Output "L" Level Voltage	V_{OL1}	$\overline{ACTL}$ to $\overline{ECTL}$, $\overline{TMOUT}$	I_{OL}=30mA, V_{DD}=18V	0		2	V
	V_{OL2}	MUTE	I_{OL}=0.4mA, $V_{DD} \geqq 9V$	0		0.5	V
Analog Switch-ON Resistance	Ron	A1 to E1, A2 to E2	I=1mA, $V_{DD}-V_{EE}$=12V		120		Ω
		TM1, TM2	I=1mA, $V_{DD}-V_{EE}$=18V		80		Ω
		OUT1, OUT2	I=1mA, $V_{DD}-V_{EE}$=37V		70		Ω
Input/Output OFF Leak Current	I_{OFF1}	$\overline{ACTL}$ to $\overline{ECTL}$, $\overline{TMOUT}$	$V_O=V_{SS}$+18V			10	μA
	I_{OFF2}	CR	$V_O=V_{SS}$+18V			1	μA
	I_{OFF3}	A1 to E1, A2 to E2, TM1,2, OUT1,2	Analog SW OFF, $V_{IN}=V_O=V_{EE}$ to V_{EE}+37V	−1		1	μA
Total Harmonic Distortion	THD	SOURCE1,2 OUT1,2	V_{IN}=1Vrms, f=1kHz, $V_{DD}-V_{EE}$=15 to 37V		0.0015	0.01	%
Feedthrough	FTH	A1 to E1 SOURCE1 OUT1; A2 to E2 SOURCE2 OUT2	$V_{DD}-V_{EE}$=37V, f=10kHz, V_{IN}=0.77Vrms, R_L=47kΩ		55		dB
Crosstalk	CT	A1 to E1 SOURCE2 OUT2; A2 to E2 SOURCE1 OUT1	$V_{DD}-V_{EE}$=37V, f=10kHz, V_{IN}=0.77Vrms, R_L=47kΩ		75		dB
Current Dissipation	I_{DD}	V_{DD}	Operating mode $V_{DD}-V_{EE}$=37V			1	mA
Muting Time	TM	MUTE		OSC period x 21			
Input Accept Pulse Width (Switch Select)	$T_{IN(1)}$	$\overline{ACTL}$ to $\overline{ECTL}$, $\overline{TMCTL}$		OSC period x 3			
Input Accept Pulse Width (Muting Output)	$T_{IN(2)}$	$\overline{ACTL}$ to $\overline{ECTL}$, $\overline{TMCTL}$		OSC period x 1			
External Capacitance for CR OSC	C1	CR		0.001		0.1	μF
OSC Period	T1	CR	$V_{DD}-V_{SS}$=6V	0.4C1R1		0.7C1R1	
	T2	CR	$V_{DD}-V_{SS}$=18.5V	0.3C1R1		0.6C1R1	
Current Dissipation	I_{DD} back up	V_{DD}	back up, V_{DD}=5V, $V_{EE}=V_{SS}$=0V			1	μA

Operation caused by combination of INIT, Min inputs

INIT	Min	Operation
H	M	Normal
H	L	Backup
H	H	Auto function
L	M	Muting
L	L	Initialize (A circuit)
L	H	Reset

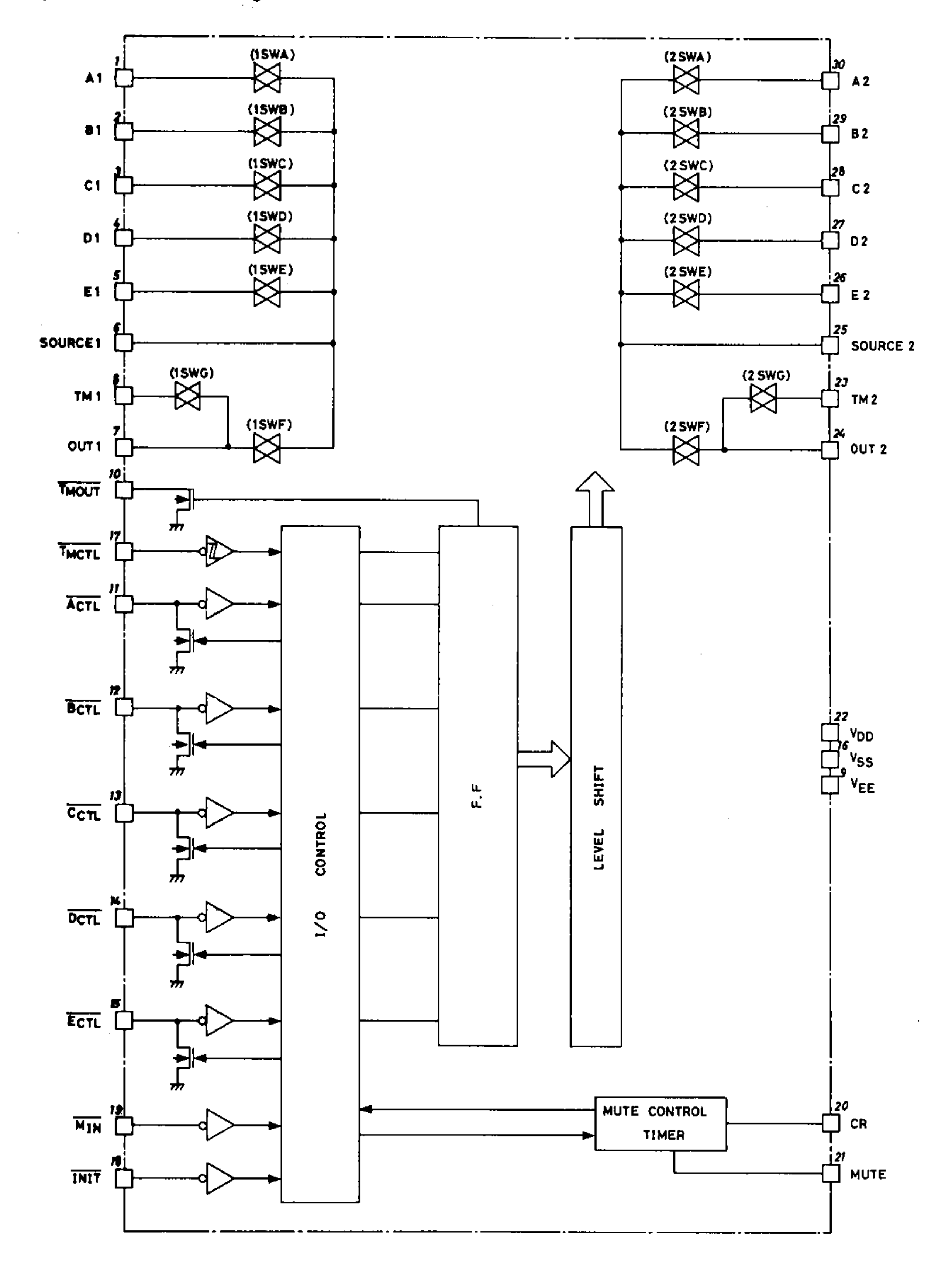


Pin Description

Pin Name	Pin No.	Input/Output Configuration	Function
V_{DD} V_{SS} V_{EE}	22 16 9		• Power supply pin Single supply (+): V_{SS}=V_{EE}=GND Dual supply (±): V_{SS}=GND, V_{EE}=(−)V
A1, B1 C1, D1 E1, TM1 A2, B2 C2, D2 E2, TM2 SOURCE1 SOURCE2 OUT1 OUT2	1, 2 3, 4 5, 8 30, 29 28, 27 26, 23 6 25 7 24		• A to E, TM: Audio signal input pin • SOURCE: Output pin for REC • OUT: Audio signal output pin
$\overline{\text{TMOUT}}$	10		• TM ON/OFF-state display LED driver output
$\overline{\text{ACTL}}$ $\overline{\text{BCTL}}$ $\overline{\text{CCTL}}$ $\overline{\text{DCTL}}$ $\overline{\text{ECTL}}$	11 12 13 14 15		• Input/output pin for analog switch control and its state display LED driver output
$\overline{\text{TMCTL}}$	17		• Input pin for TM control
$\overline{\text{INIT}}$	18		• Input pin for mode setting (Details are given on page 2.)
$\overline{\text{MIN}}$	19		• Input pin for mode setting (Details are given on page 2.)
CR	20		• Input/output pin for clock generation C1, R1 are connected.
MUTE	21		• Output pin for muting control

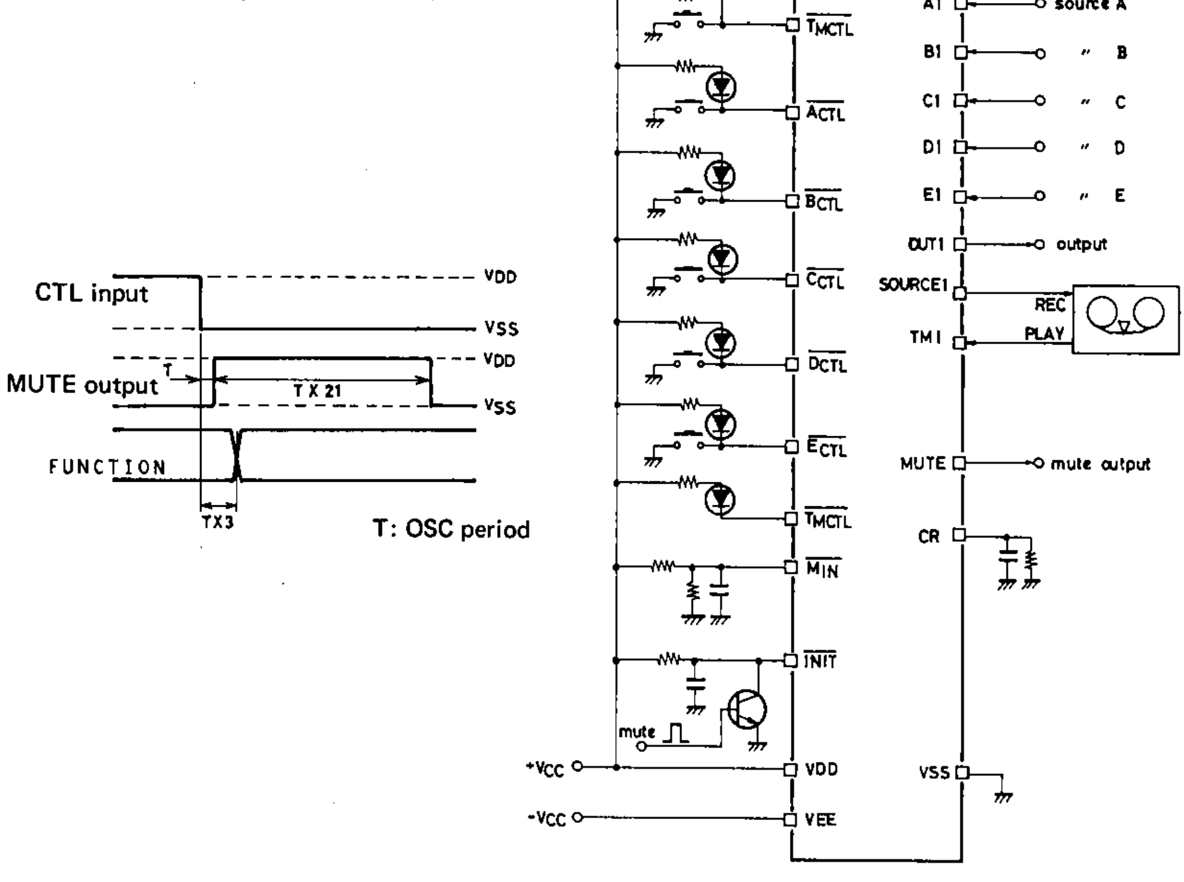
Note: Priority for simultaneous push of keys is given as shown below.
$\overline{\text{TMCTL}}$>$\overline{\text{ACTL}}$>$\overline{\text{BCTL}}$>$\overline{\text{CCTL}}$>$\overline{\text{DCTL}}$>$\overline{\text{ECTL}}$
The pin ($\overline{\text{ACTL}}$ to $\overline{\text{ECTL}}$ pins) whose LED driver is turned ON (function selected) does not accept key input. Key input to such pin causes no operation to occur.

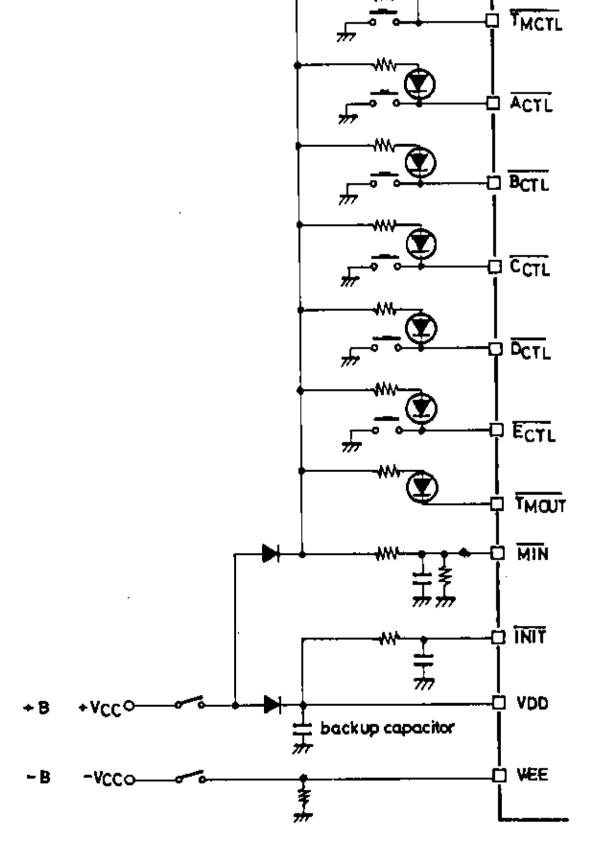
Equivalent Circuit Block Diagram



Application Circuit

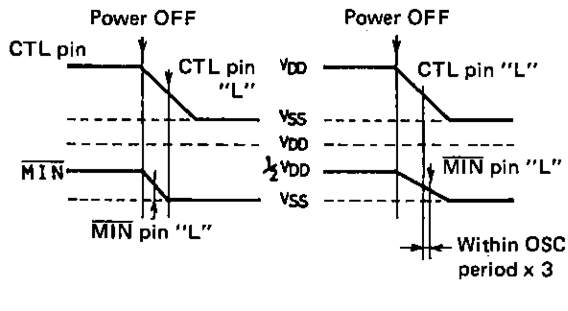
(1) Initialization, muting mode
(One channel only is shown below.)



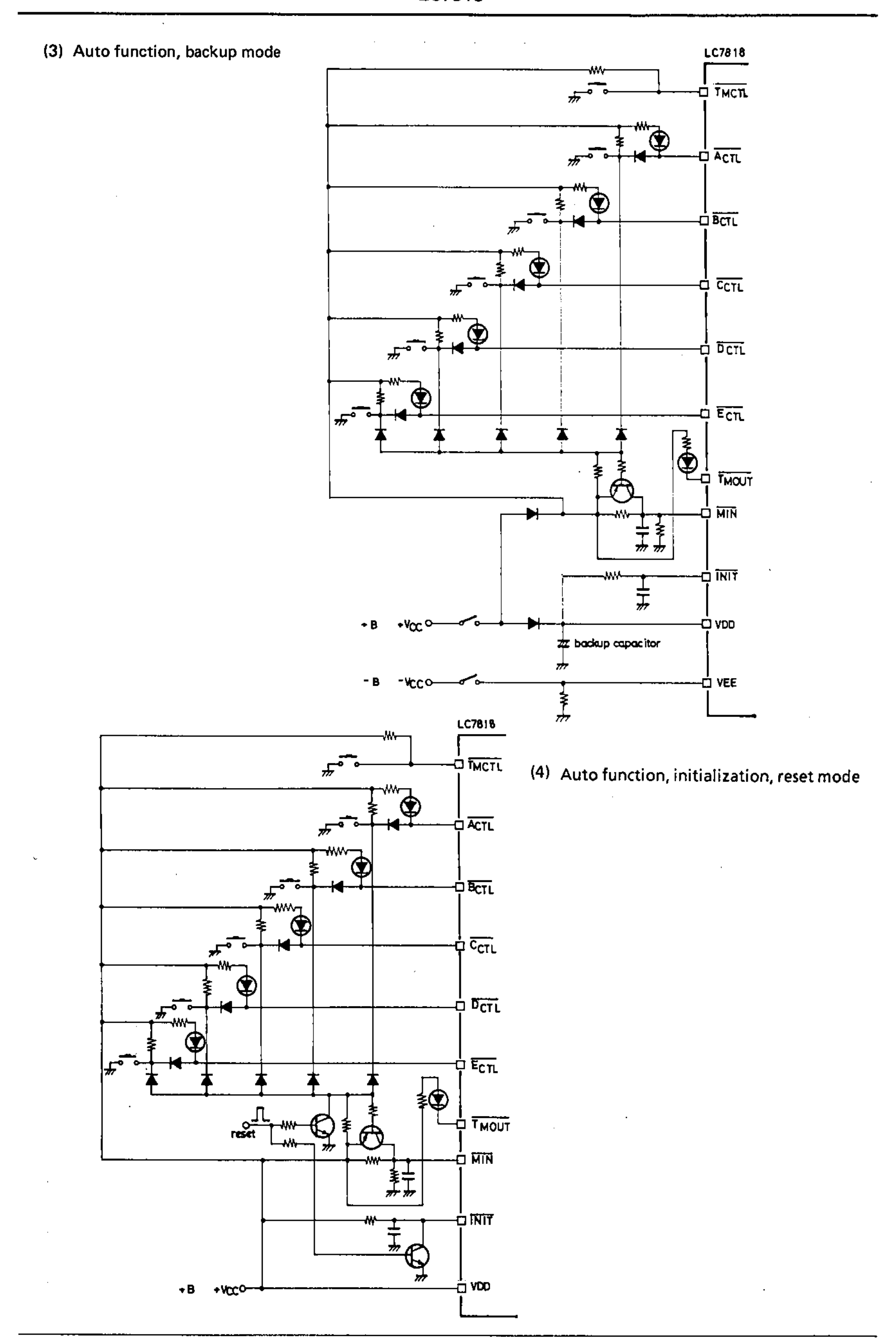


(2) Backup mode
(Audio section, MUTE circuit are omitted.)

If the power switch is set to the primary side at the backup mode and it takes time for +B to fall when power is turned OFF, the MIN pin must be brought to "L" state before the ACTL to ECTL, TMCTL pins are brought to "L" state or the MIN pin must be brought to "L" state within OSC period x 3 in case the ACTL to ECTL, TMCTL pins are brought to "L" state earlier; otherwise the function may be shifted to another.



(3) Auto function, backup mode



(4) Auto function, initialization, reset mode

INIT	MIN	Operation	Description
H	M	Normal	• This state is kept at the normal operation mode.
H	L	Backup mode	• The backup mode is entered at this state.
H	H	Auto function (TM reset)	• When the $\overline{ACTL}$ to $\overline{ECTL}$ input occurs, set to this state. Set to "H" for OSC period x 3 or greater.
L	M	Muting	• When applying muting regardless of the function select key, set to this state. OSC period x 22
L	L	Initialization (A circuit ON)	• The TM is turned OFF and the A circuit is turned ON. • To initialize, hold this state for OSC period x 3 or greater.
L	H	Reset	• All input circuits are turned OFF. 20μsec. or greater.